

ABSTRACT OF THE DISCLOSURE

The invention offers a regenerative optical amplifier enabling voltage to be easily applied to polarizing elements such as Pockels cells, without the need for complicated drive circuitry. An input beam of S-polarized light is reflected by a polarizer 1 and advances to a Pockels cell 2. In the time it takes for the input beam, having once passed through the Pockels cell 2, to be reflected by a reflective mirror 3 and return to the Pockels cell 2, a voltage V_{P1} causing a 90-degree rotation in the polarization of transmitted light is applied to the Pockels cell 2, and this applied voltage V_{P1} is maintained. The input beam is converted by the Pockels cell 2 into a P-polarized light pulse which is transmitted by the polarizer. Subsequently, the light pulse is converted from P-polarized light to S-polarized light and back to P-polarized light with each roundtrip of the Pockels cell 2, while passing each time between the reflective mirror 3, laser crystal 4 and reflective mirror 7, so as to be amplified in the resonator formed thereby. The amplified light pulse is extracted by applying a voltage V_{P2} causing a 90-degree rotation of the polarization of the transmitted light to the Pockels cell 6 to convert the light pulse to S-polarized light which is then reflected out of the resonator by the polarizer 5.